

UNCLASSIFIED

AD NUMBER

AD824488

LIMITATION CHANGES

TO:

Approved for public release; distribution is unlimited.

FROM:

Distribution authorized to U.S. Gov't. agencies and their contractors; Critical Technology; 02 FEB 1967. Other requests shall be referred to Assistant Chief of Staff Force Development (Army), Attn: FOR-OT-RD, Washington, DC 20310. This document contains export-controlled technical data.

AUTHORITY

AGO D/A ltr, 29 Apr 1980

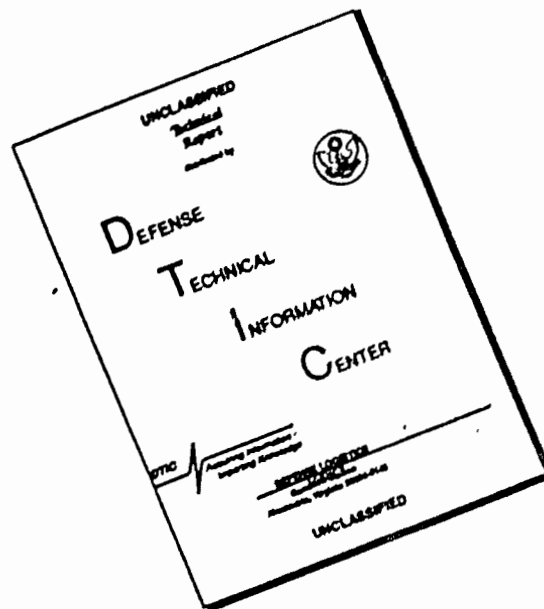
THIS PAGE IS UNCLASSIFIED

THIS REPORT HAS BEEN DELIMITED
AND CLEARED FOR PUBLIC RELEASE
UNDER DOD DIRECTIVE 5200.20 AND
NO RESTRICTIONS ARE IMPOSED UPON
ITS USE AND DISCLOSURE.

DISTRIBUTION STATEMENT A

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.



DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310



AD 824488

IN REPLY REFER TO
AGAM-P (M) (25 Jan 67) FOR OT

2 February 1967

SUBJECT: Operational Report - Lessons Learned, HQ, 84th Engineer Battalion
(Construction)

TO: SEE DISTRIBUTION

1. Forwarded as inclosure is Operational Report - Lessons Learned, Headquarters, 84th Engineer Battalion (Construction) for quarterly period ending 31 October 1966. Information contained in this report should be reviewed and evaluated by CDC in accordance with paragraph 6f of AR 1-19 and by CONARC in accordance with paragraph 6c and d of AR 1-19. Evaluations and corrective actions should be reported to ACSFOR OT within 90 days of receipt of covering letter.

2. Information contained in this report is provided to the Commandants of the Service Schools to insure appropriate benefits in the future from lessons learned during current operations, and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

Kenneth G. Wickham

KENNETH G. WICKHAM
Major General, USA
The Adjutant General

1 Incl
a/s

DISTRIBUTION:

Commanding General

US Army Combat Development Command
US Continental Army Command

Commandants

US Army Command and General Staff College
US Army War College
US Army Air Defense School
US Army Artillery and Missile School
US Army Armor School
US Army Chemical Corps School
US Army Engineer School
US Army Military Police School
US Army Infantry School
US Army Intelligence School
US Army Medical Field Service School
US Army Ordnance School
US Army Quartermaster School
US Army Security Agency School

(Continued on page 2)

FOR OT AD

660363 Incl 153

STATEMENT #2 UNCLASSIFIED
This document is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of DEPT OF ARMY
OFFICE OF ASST CHIEF OF STAFF
FOR FORCE DEVELOPMENT
ATTN: FOR-CT-RD
WASH. D.C.
20310
D D C
RECEIVED
JAN 2 1968
REGULATED

DISTRIBUTION (Cont'd)

US Army Signal School
US Army Transportation School
US Army Special Warfare School
US Army Civil Affairs School

WHITE SECTION <input type="checkbox"/>	
BUFF SECTION <input checked="" type="checkbox"/>	
SPECIFICATION	
Y	
DISTRIBUTION/AVAILABILITY CODES	
DIST.	AVAIL. and/or SPECIAL
2	

HEADQUARTERS
84TH ENGINEER BATTALION (CONSTRUCTION)
APO 96238
San Francisco, California

EGD-84E-CO

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 October 1966

THRU: Commanding Officer
45th Engineer Group (Const)
APO 96238

Commanding General
18th Engineer Brigade
APO 96307

Commanding General
United States Army, Vietnam
ATTN: AVC-DH
APO 96307

Commander In Chief
United States Army, Pacific
ATTN: GPOP-MH
APO 96558

TO: Assistant Chief of Staff for Force Development
Department of the Army (ACSFOR DA)
Washington, D. C. 20310

1. SIGNIFICANT ORGANIZATIONAL ACTIVITIES: During the reporting
period the 84th Engineer Battalion (Construction) was active on the
following projects:

a. An Khe Airfield, Brigade 66-11DC-937

The project consists of design and construction of a forward
area, medium-lift airfield with associated ramps, taxiways and parking
aprons. The wearing surfaces are to be 2" of double surface asphalt.

Incl 1

EGD-84E-CO

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

The project was started on 7 March 1966 and is presently 59% complete. To date, 98,789 US man-hours and 21,814 equipment hours have been expended. During this period, starting on 1 October 1966, rehabilitation of the existing PSP runway was undertaken. This rehabilitation consists of removing the existing PSP wearing surface; removing the sand layer beneath the PSP by blading, sweeping and blowing; and providing an asphalt double surface treatment for the wearing surface. This work, being done while insuring that the runway remains operational, is 100% complete. A total of 12,000 US man-hours and 2940 equipment hours were expended.

b. 60-Ton Ice Plant, An Khe, 35-937/V-66

This project, started on 20 May 1966 and presently 65% complete, consists of construction of a 60-ton ice plant, including site layout, electrical wiring, power installation and associated structures. To date, 30,704 US man-hours and 3253 equipment hours have been expended.

c. Dial Office, An Khe, Brigade 66-400C-937

This project, started on 5 March 1966 and completed on 10 October 1966, consisted of site preparation and construction of a 40' x 100' wood frame building to be used as a central dial office building. Construction effort included the expenditure of 24,517 man-hours and 1773 equipment hours.

d. Interior, Dial Office, An Khe, Brigade 66-140C-937

This project consists of the completion of the interior of the Dial Exchange building IAW standard Yards and Docks Drawings. Since the starting date of 27 September 1966, 3741 man-hours and 164 equipment hours have been expended, and the project is presently 82% complete.

e. Permanent Ammunition Storage, Phu Tai Valley, Brigade 66-26C-937

This project was started on 24 November 1965 under Construction Directive Log 937-37 by the 299th Engineer Battalion (Combat). Responsibility for completion of this project was assigned to this command with an effective starting date of 20 August 1966. The scope of work includes completion of fifty-four (54) 40' x 140' reinforced concrete storage pads, four (4) each four-hole latrines and twenty (20) ea guard towers. New construction includes a 300' x 300' hardstand, 20' x 50' surveillance building, two (2) ea 20' x 48' steel arch earth-covered magazines and access roads throughout the area. The project is presently 83% complete, and to date this unit has expended 33,744 US man-hours, 37,670 VN man-hours and 8842 equipment hours.

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

f. Cantonment Construction, Phu Tai Valley, Brigade 66-142DC-937

Initially this directive called for the design of self-help construction for a 3000-man cantonment in Valley A. Recently, however, new cantonment areas throughout Phu Tai Valley have come to be included under this directive. Presently approved plans call for construction of 14,400 SF of community facilities, 168,000 SF of troop housing, 23,200 SF of mess halls and 23,200 SF of administration-supply buildings. Engineer troop effort in support of this project amounts to 20,864 man-hours since the project starting date of 10 September 1965. In addition, 16,642 VN man-hours and 320 equipment hours have been expended. Approximately 18,000 man-hours of self-help construction have also been expended. The effort listed above has resulted in the completion of 38,400 SF of troop billets, 8000 SF of mess halls, and 3600 SF of administration-supply buildings. Based on the number of buildings completed and proposed at the present time, this project is 19% complete.

g. Cantonment Construction, Brigade 65-15C-937

This directive covers self-help construction throughout the Qui Nhon area. Presently approved plans call for the construction of 374,000 SF of troop billets, 27,600 SF of mess halls, 75,200 SF of administration-supply buildings and 4056 SF of maintenance buildings. To date, 59,450 US engineer, 57,672 local national and approximately 140,000 self-help man-hours have been expended to complete the following: 172,000 SF of troop housing, 5600 SF of mess halls and 21,600 SF of administration-supply buildings. Based on the number of buildings completed and presently proposed, this project is 39% complete.

h. Rock Quarry and Crusher, 75-ton, An Khe, 61-937/V-86

The project consists of operating two (2) ea 75-ton crushers to provide crushed rock to be used for projects in the An Khe area. To date, 97,113 US man-hours and 36,650 equipment hours have been expended, and approximately 36,600 CY of rock have been crushed.

i. Rock Quarry and Crusher, 225-ton, Phu Tai, 2-937/V-65

This crusher, which began operation on 15 June 1966, provides crushed rock for use in the Qui Nhon area. To date, 33,922 US man-hours, 16,560 local national man-hours and 23,652 equipment hours have been expended. Approximately 18,900 CY of rock have been crushed.

j. Vung Chua Signal Relay Site Improvements, Brigade 66-113C-937

This project, started on 1 June 1966 and completed on 15 October 1966, consisted of cutting and grading an area approximately 80' x 100' and constructing three (3) concrete pads for the installation of

EGD-84E-00

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

TROPO units. Pads were also constructed for two (2) shelters and two (2) antenna bases. The project involved the expenditure of 2924 US and 2810 local national man-hours and 734 equipment hours.

k. Qui Nhon Depot, Brigade 66-27DC-937

The project includes construction of open storage areas, shed storage, prefabricated metal warehouses, administration buildings, security fencing, roads and drainage facilities. The project was started on 1 August 1965 and is presently 66% complete. The completed work consists of 112,400 SF of open storage, 177,400 SF of covered storage and 22,000 SF of administration buildings. To date, 236,029 US man-hours, 36,502 local national man-hours and 36,448 equipment hours have been expended.

1. Storm Drainage, Qui Nhon Army Airfield; 76-937/V-66

Project consists of constructing 3 or 4 dry wells with PSP lids. This project, started on 1 September 1966, is 75% complete, and to date, 932 US man-hours and 100 local national man-hours and 204 equipment hours have been expended.

m. Port Access Road (Interim); 70-937/V-66

This road, in excess of 4000 feet long, is to extend from Gia Long Street in the city of Qui Nhon to the DeLong Pier. Phase I consists of the actual construction of the laterite road over hydraulic fill. The minimum compacted thickness of laterite is 18", and the road has a 48' traveled way with 6' shoulders for approximately the first half of the length; at this point the traveled way narrows to a width of 24 feet. Phase I also includes associated facilities, such as grade crossings and drainage. Phase II consists of completing the interim access road by placing a select base of rock on the laterite subbase and then applying a double bituminous surface treatment as the wearing course. Phase I is presently 95% complete, and to date, 15,328 US man-hours and 2990 local national man-hours and 10,818 equipment hours have been expended. This effort includes the hauling of 22,112 CY of laterite.

n. 85th Evacuation 540-Bed Hospital, Brigade 65-7DC-937

This project was originally base camp project 937-09 and later redesignated as a hospital. Work on this project, which began on 12 October 1965, is presently 98% complete. In addition to the 540-bed facility with its associated structures, covered walkways were constructed between and alongside the hospital quonsets. At the present time hospital drainage facilities are being completed, and three of ten proposed 20' x 120' standard frame troop billets are complete. To date, this project has involved the expenditure of 128,293 US and 17,761 local national man-hours and 28,678 equipment hours.

EGD-84E-00

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

o. Rehabilitation of Roads #1 and #2 and Villa Road, Brigade 65-20DC-937

Although initial plans called for the eventual surfacing of these roads with a double surface treatment, engineer effort has been confined to maintenance of the roads. Hauling of 11,000 CY of fill to maintain these roads has resulted in the expenditure of 10,843 US and 3351 local national man-hours and 4447 equipment hours.

p. Pontoon Pier LCU, LCM & LST Ramps, Brigade 66-37DC-937

The project consists of design and construction of a 500' pontoon finger pier and two each LCU, LCM ramps and appropriate mooring facilities. One of the ramps is 210' x 58' with a granite cube stone (6" x 8" x 8") surface. The other is 120' x 58' with an 8" reinforced concrete surface. Mooring facilities consist of four (4) each pile mooring dolphins adjacent to the derelict at the end of the can dock; one (1) each single pile at each end of the derelict and ten (10) each mooring anchors at the LCU, LCM ramps. The project is 98% complete, and to date, 63,000 US and 22,073 local national man-hours and 16,375 equipment hours have been expended.

q. Refrigeration Facilities, Brigade 66-61C-937

This project consists of the construction of 9' x 32' concrete pads and the erection of 1600 CF prefabricated reefer units upon these pads. Fifty-nine (59) of these units have already been installed in the Qui Nhon Log Depot and are presently operational; thirty-four (34) units are programmed for the Valley A cantonment area in Phu Tai Valley. To date, the erection of these units has resulted in the expenditure of 9829 US and 15,647 local national man-hours and 1707 equipment hours.

r. 4" Submarine Pipeline, Brigade 66-177DC-937

Under the provisions of this directive, the existing 4" pipeline in the Qui Nhon harbor is to be extended to a length of 5500' to an existing four-point mooring system. In addition, two (2) other 5500' 4" submarine pipelines are to be installed alongside the existing line. This project is approximately 50% complete, with the extension of the existing line having been accomplished, and to date 6960 US and 990 local national man-hours and 908 equipment hours have been expended.

s. 314-Man Cantonment, Brigade 66-159DC-937

This directive provides for the construction of a 314-man cantonment adjacent to the 67th Evacuation Hospital. Engineer effort will be utilized for site preparation, construction of a 20' x 120'

EGD-84E-CO

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

double-story EM billet and two (2) each 20' x 48' tropicalized quonsets with concrete floors for administration and community facilities, and to provide adequate drainage facilities. Work accomplished so far has been limited to site preparation, and to date 130 US and 380 local national man-hours and 23 equipment hours have been expended.

t. Log Depot Expansion, Phu Tai Valley, Brigade 66-156DC-937

Based on a Qui Nhon Base Development Plan, this directive calls for the design and construction of the Qui Nhon Depot expansion as follows: Cold Storage: 456,000 CF; Covered Storage: 400,000 SF; Open Storage: 512,000 SY. Provisions are also included for drainage facilities and access and internal roads. Engineer effort to date has been confined to extensive survey work and translation of field data to useable information. It is expected that the entire project will entail the expenditure of better than four (4) battalion months and several hundred thousand man-hours of local national effort.

u. Combat Support

Throughout this reporting period battalion construction was delayed due to combat support commitments. To date, over 90,000 US engineer troop man-hours and over 15,000 equipment hours have been expended.

2. COMMANDER'S OBSERVATIONS AND RECOMMENDATIONS

a. Part I: Lessons Learned

PERSONNEL

(1) ITEM: Supervision of Vietnamese National day labor

(a) DISCUSSION: Vietnamese National day laborers are used on routine activities, such as ditch digging, grass cutting and building security fences. These activities are conducted with a GI supervisor for four (4) crews totaling 80 Vietnamese. Production of the work crews is about 65% of the production of work crews supervised at one (1) GI per 30 laborers.

(b) OBSERVATION: Vietnamese day labor can be worked with minimum supervision if the lower efficiency can be tolerated.

(2) ITEM: Safety hazards in utilizing Vietnamese National day labor

(a) DISCUSSION: Vietnamese semi-skilled and unskilled day labor was used in construction of two-story 20' x 80' standard billets

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

for carrying materials, placing panels and other semi-skilled work. Without very close supervision, they present a safety hazard to themselves and others working on the same project. The laborers give no consideration to movement or where they set down tools and materials when working around scaffolding, causing a safety hazard for personnel working in the area.

(b) OBSERVATION: When utilizing Vietnamese day labor around vertical construction projects, at least one (1) US should be employed as a "safety supervisor" for the day labor.

OPERATIONS

(3) ITEM: Erosion control

(a) DISCUSSION: In using peneprime for erosion control, two (2) factors seem to determine whether or not it will be effective. One is the condition of the surface it is applied to; the other is the length of time it is allowed to cure before any traffic or water hits the surface.

(b) OBSERVATION: By first smoothing and compacting the surface of an area to which peneprime is to be applied, a more erosion-resistant surface will be obtained. If a layer of dust exists, it is best to spray it with water and compact it into a firm surface so that the peneprime will penetrate into a solid surface rather than a soft dust layer. Once peneprime is applied, it should be allowed to cure for 24 to 48 hours before water gets to it and there should be absolutely no traffic on it. Peneprime, once it cures, forms a hard crust on the surface which is water resistant; however, if this crust is broken, the water gets underneath it and simply erodes the remaining portion away. This is why it is so necessary to keep traffic off the peneprimed areas, especially around culvert headwalls and ditch walls, which have a high percent slope.

(4) ITEM: Erosion and sedimentation

(a) DISCUSSION: On large drainage surfaces consisting of loose soil without any cover and having slopes greater than 2 or 3%, serious erosion to be followed by silting of drainage structures in low relief areas can be expected during the monsoon season. The above problem was encountered at the Ammo Supply Point, located about 5.5 miles from Qui Nhon at a grid azimuth of approximately 230°. The stripped areas and fills with excessive slopes experience serious erosion, while the drainage ditches and some of the culverts were completely clogged by sediment deposits.

(b) OBSERVATION: When designing drainage structures the effects of construction on the natural terrain must be predicted.

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

The design must integrate the proposed construction area into the existing drainage basin drainage. Design of slopes is critical, since high slopes will result in excessive erosion, and low slopes will cause sediments to be deposited. Fines and sand will not be deposited over grades greater than about 2%, while ditches having slopes greater than 6 to 8% will probably have to be lined. In areas where minimum slope criteria cannot be met due to low relief, settling basins must be provided and cleaned out periodically to insure a functional drainage system.

(5) ITEM: Liquefaction

(a) DISCUSSION: Complete loss of soil bearing capacity was encountered while clearing and grubbing with dozers at the depot expansion site, located approximately 7.5 miles from Qui Nhon on a grid azimuth of 250°. The soil failed almost instantaneously under the tracks of a dozer and changed into freely flowing mud, allowing the dozer to settle past the top of the tracks. Upon examination it was found that the water table was almost at the surface and that the soil had a large content of silt to fine sand-sized particles with some organic matter. It was not possible to predict the location of the likely failure zones, but a 4-ton vehicle could drive up to the stuck dozer with no difficulty.

(b) OBSERVATION: Under certain loading conditions associated with some type of vibratory motion, soil consisting of silt-to sand-sized particles and having a high water table is susceptible to losing all bearing capacity in a matter of a few minutes. Two possible solutions are to decrease the water table and/or to raise the finished grade with fill, thereby decreasing the load. When soil conditions as described are encountered, a careful engineering study should be made to determine the feasibility of carrying out a construction program at such a site without the problems cited above.

(6) ITEM: Rolling asphalt

(a) DISCUSSION: Rolling asphalt in rainy weather may crack the surface enough to allow water penetration, which will result in softening of the subsurface.

(b) OBSERVATION: Rolling of asphalt should be suspended during rain.

(7) ITEM: Spreading rock for surface treatment asphalt

(a) DISCUSSION: Spreading rock for asphalt in excessively thick layers requires many additional man-hours to remove the excess.

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 October 1966

(b) OBSERVATION: Care must be exercised to insure that rock is spread evenly and in the correct quantity.

(8) ITEM: Finish surface for double surface treatment asphalt

(a) DISCUSSION: It is desirable to have a seal coat on double surface asphalt pavement which will also enhance the appearance of the finished job.

(b) OBSERVATION: On a double surface treatment of 3/4" (-) rock and chips, a seal coat of crusher fines makes a good finished surface.

(9) ITEM: Removing PSP runway sections

(a) DISCUSSION: It is often difficult to "unseat" PSP that has been in place for long periods and is imbedded into the subsurface.

(b) OBSERVATION: The use of two dozers, one to push and one to pull, will easily "unseat" large sections of PSP. After "unseating," the pull dozer can drag the sections alone.

(10) ITEM: Assembly of corrugated metal culvert

(a) DISCUSSION: Difficulty is often encountered when trying to match holes of two halves of culvert pipe during assembly.

(b) OBSERVATION: Assembly is greatly facilitated by the use of "C" clamps to hold the two halves together while they are being bolted.

(11) ITEM: Fabrication of louver blocks for louvered siding

(a) DISCUSSION: A repetitive cutting operation, such as cutting louver blocks for siding, is most efficiently performed by a radial arm saw; however, most units do not have radial arm saws as TO&E equipment.

(b) OBSERVATION: As a substitute for a radial arm saw, a bench saw may be improvised by mounting a Skill Saw upside down on a sheet of plywood.

(12) ITEM: Water for concrete

(a) DISCUSSION: Difficulty is often encountered in obtaining water distributors to be used for concrete pours.

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

(b) OBSERVATION: A fuel bladder filled with water and carried on a truck provides a good solution to the problem.

(13) ITEM: Drainage systems in Qui Nhon

(a) DISCUSSION: Having worked on several drainage projects in the area, this unit has encountered many problems. The largest seems to be the flatness of the area and the lack of coordination between units to come up with an overall drainage system for the Qui Nhon area. Lack of this is evident in the 85th Evacuation Hospital area, where water is drained under the most difficult conditions, caused by lack of adequate fill and the absence of satisfactory drainage collection areas. Two (2) makeshift sumps have been constructed at each end of the system to collect the water and allow it to seep through the sand down to the water table. Laterite washed down from the hospital area has settled to the bottom and sealed off the sand, thus preventing water seepage to the water table. A better solution would be to design an overall system whereby water is drained in a surface ditch to the ocean.

(b) OBSERVATION: Better coordination is needed between local population and US units and among US units themselves to solve the drainage problem. An attempt should be made to remove the laterite cover on the sand sump to enhance its water absorption capabilities.

(14) ITEM: Tire changing on 5-ton trucks

(a) DISCUSSION: Five-ton dump trucks have become a critical item to all engineer units. The rough roads and quarry operations have increased the "down" time due to flat tires. The time required to change tires can be reduced by utilization of the electric impact wrench, which is a component in the Pioneer Electric Trailer.

(b) OBSERVATION: The time required to change flats, either inside or outside, is more than 50% reduced. This time savings can be used to advantage when hauling equipment is critical.

(15) ITEM: Electrical power for job sites

(a) DISCUSSION: After extended duty in Vietnam, many of our smaller generators are either deadlined or not a reliable source of power. A large percentage of vertical construction projects are located in areas where power could be obtained within 500 feet from neighboring units and installations. Construction platoons should be authorized to draw wire and a circuit breaker panel. This power line could be used on various construction projects.

(b) OBSERVATION: The TO&E generators can be utilized for emergency power requirements on projects where no suitable power is available.

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

(16) ITEM: Changing 830M tires

(a) DISCUSSION: Changing 830M tires without a wrecker or port-a-power can be done if the following procedure is used. The outer rim can be broken by using a dozer and a 4" x 8" timber, pushing the tire back against the inner rim and breaking it loose. The tire is then broken loose from the inner rim by a cable sling between the rim and tire in a horizontal plane to the axle. A dozer or grader will pull the cable between the rim and tire. The tire can then be removed. With four (4) men and a long pry bar the new tire can be mounted.

(b) OBSERVATION: This operation eliminates the use of two (2) items of equipment, the port-a-power and wrecker or crane. This method is almost as fast as with the proper equipment. One drawback is that this can only be used on the tractor; a wrecker is still required to change scraper tires.

(17) ITEM: Formation of sand boils or springs

(a) DISCUSSION: While pumping out a cofferdam, sand boils or springs were observed. This is a warning signal of an impending failure either by "piping" or by complete loss of bearing by the soil due to quick condition. The springs are especially dangerous when found in fine, non-cohesive type soils.

(b) OBSERVATION: As soon as springs are observed, they should be covered with surcharge consisting of gravel or sand type material. For best results the surcharge should meet filter specifications; however, a good field expedient is obtained by using sandbags filled with clean sand. The surcharge will serve two (2) purposes. First, it will prevent washing away of fines which could lead to a sudden blowout-like failure caused by "piping." Secondly, the weight of the surcharge will increase the factor of safety against heave or quick condition type failure, caused by the upward flow of water.

(18) ITEM: "Boiling" during cofferdam construction

(a) DISCUSSION: The problem of "boiling," which was evidently partly caused by the hydraulic head on the outside of the cofferdam, was encountered during construction. This "boiling" is one indication that the wall may not have sufficient penetration.

(b) OBSERVATION: During later construction, a thirty-foot pile instead of the twenty footers was used. A greater penetration was obtained as well as a stronger wall as a result. The "boiling" action was negligible as a result.

(19) ITEM: Water leakage in sheet pile

EGD-SAE-00

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1966

(a) DISCUSSION: Throughout construction of LCU, LCM Ramps, the problem of a certain amount of water leaking through the joints in the sheet pile was prevalent.

(b) OBSERVATION: The first attempt to stop the leaking was with sweeping compound taken under water on the outside of the sheet pile wall and stuffed into the joints of the pile where it was leaking. It was expected that the hydraulic head would force the compound into the area which was leaking. Only moderate success was achieved when instead it was attempted to use sawdust. It was soaked, water-logged and employed in the same manner as the sweeping compound. The latter method worked better than the compound, but only moderate success was achieved.

(20) ITEM: Extraction of cofferdam wall

(a) DISCUSSION: In the extraction of a cofferdam wall, it was discovered that a crane could not apply enough force to pull the pile.

(b) OBSERVATION: A piece of one and one-half (1½) inch pipe about fifteen (15) feet long was welded to an air hose connection at one end. This pipe was coupled to a 600 CFM air compressor with an air hose. The combination was used by "jetting" the pipe down along the side of the sheet pile. The large quantity and high pressure of the air blast flushed the soil away from the pile and allowed extraction.

PREPARATION FOR OVERSEAS MOVEMENT

(21) ITEM: Shipment of general red TAT equipment

(a) DISCUSSION: Pallets are susceptible to being severely damaged in shipment, rained upon and, in some cases, lost in the moving shuffle. Unit commanders should insist on all red TAT being shipped overseas in conex containers. Extra man-hours due to the handling of excessive quantities of palletized cargoes during various stages of shipment can be eliminated by the use of conex containers.

(b) OBSERVATION: Difficulty was encountered state side when Post Transportation was approached concerning the need for conexes. It is suggested that units on orders for shipment overseas be allowed to draw a minimum number of conexes IAW the size and requirement of the unit. Local transportation authorities should be made aware that ammunition must be shipped overseas in conex containers only.

(22) ITEM: Transportation of issued weapons

EGD-84E-CO

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 October 1966

(a) DISCUSSION: Upon embarkation one unit was required to break down all M-14 rifles into the three major groups and stuff components into individual duffle bags. This caused extra work, inconvenience and the loss of several small rifle parts.

(b) OBSERVATION: It is recommended that issued weapons be carried in sturdy, lockable boxes for ease of handling and security reasons.

(23) ITEM: Assignment of personnel

(a) DISCUSSION: Last minute assignments were filled with personnel who could not be prepared for PCR status within a reasonable time frame.

(b) OBSERVATION: The unit commander should endeavor to arrange with his post level AG personnel section for an appropriate cut-off date to prevent such last minute assignments. It is also recommended that all further personnel assignments to an alerted unit be cut off upon the date of the commencement of PCM leave. Exceptions should only be authorized with the unit commander's consent.

(24) ITEM: TO&E equipment

(a) DISCUSSION: Due to the critical shortage and need of all items of engineer and ordnance equipment, pieces of equipment necessary for essential purposes of the mission are pressed into almost immediate service upon their unloading at the port of debarkation. Poorly prepared equipment that is not up to the high standards of maintenance demanded by the RVN operations will immediately break down and place unit maintenance at a marked disadvantage before it can become effectively operational.

(b) OBSERVATION: Since one of the most crippling delays of the engineer mission is deadlined vehicles, every effort must be made to see that all equipment is in top operational order prior to shipment overseas. Only equipment that has received a full PCM check for serviceability should be shipped initially with the unit. Any equipment received with too short a time frame to successfully undergo such a check should be held back temporarily for shipment upon attainment of PCM status.

(25) ITEM: Possession of personal firearms

(a) DISCUSSION: Provost Marshall authorities and local area command headquarters throughout Vietnam are making it increasingly inconvenient and complicated for a person who is in possession of a personal side arm. For those who have such weapons,

EGD-84E-CO

14 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 October 1966

uniform regulations prevent their authorized wear or carrying on the person, and regulation and shipment back to CONUS is tightly controlled and regulated.

(b) OBSERVATION: Unit commanders will save themselves and their assigned personnel much time and money if the carrying overseas of personal firearms is emphatically discouraged.

b. ~~Part~~ II: Recommendations: None

WILLIAM A RANK
ITC, CE
Commanding

EGC-3 (14 Nov 66)

1st Ind

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 October 1966

HEADQUARTERS, 937TH ENGINEER GROUP (COMBAT), APO 96318, 20 November 1966

THRU: Commanding General, 18th Engineer Brigade, APO 96307

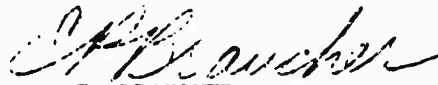
Commanding General, United States Army, Vietnam, ATTN: AVC-DH, APO 96307

Commander In Chief, United States Army, Pacific, ATTN: GPOF-MH, APO 96558

TO: Assistant Chief of Staff for Force Development, Department of the Army
(ACSFOR DA), Washington, D.C. 20310

1. Observations under title "PREPARATION FOR OVERSEAS MOVEMENT" (Section II, Part I, Items (21), (22), (23), (24), and (25)) are based on experience of the 585th Engr Co (DT), 73d Engr Co (CS), and 444th Engr Det (Conc) which arrived in-country during the period.

2. I concur in all observations except item (24), TO&E Equipment. Maximum emphasis must be placed on proper preparation of vehicles and equipment before movement; however, to leave behind "temporarily" equipment not fully prepared would, in all probability, result in an excessive time lag before joining its parent unit. It is recommended that such equipment be shipped with the remainder of the unit equipment and prepared after arrival in-country for operations. Although this is burdensome and inefficient, it will still result in the equipment being available sooner than if left behind for later processing and shipment.



E. P. BRAUCHER
Colonel, CE
Commanding

AVBC-C (14 Nov 66) 2d Ind
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for Quarterly
Period Ending 31 October 1966

Headquarters, 18th Engineer Brigade, APO 96307 12 DEC 1966

TO: Commanding General, United States Army, Vietnam, ATTN: AVC-DH,
APO 96307

1. The subject report, submitted by the 84th Engineer Battalion (Const), has been reviewed and is considered an adequate report of organizational activities.

2. This headquarters concurs with the observations of the submitting and indorsing commanders, subject to the following comments:

a. Section 2, Part I, para a(5) Liquefaction. Competent personnel in soils engineering or geology should be included in the initial area reconnaissance. Their observations should include the location of the ground water table, old lake formations, clay plugs (oxbow lakes) and other troublesome features. Such observations are essential for an adequate foundation, route, or other type vertical or horizontal construction design.

b. Section 2, Part I, para a(9). Non-concur. Each removal operation must be evaluated in accordance with the physical engineering peculiarities which are in being at the site. The salvage value, of the in place pierced steel plank (PSP), must be considered which off times dictates the removal method.

c. Section 2, Part I, para a(11). Fabrication. This is a good expedient, with one caution. When mounting the skill saw in this manner the safety shield must be left in place.

d. Section 2, Part I, para a(14). Frequent use of "oil can" maintenance will further reduce the "down" time in this operation.

e. Section 2, Part I, para a(15). The expedient power line is an excellent auxiliary and would provide adequate power in most instances. Units can requisition the required material through normal supply channels.

f. Section 2, Part I, para a(16). This headquarters agrees with this operation in principle, but does not concur with the use of a grader, as it must never be used to pull a heavy load or to be subjected to undue stresses.

FOR THE COMMANDER:

Wayne J. Reynolds
WAYNE J. REYNOLDS
Major, CE
Adjutant

16

AVHGC-DH (14 Nov 66)

3d Ind

SUBJECT: Operational Report-Lessons Learned for the Period Ending
31 October 1966 (RCS CSFOR-65)

29 DEC '66

HEADQUARTERS, UNITED STATES ARMY VIETNAM, APO San Francisco 96307

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-OT
APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the period ending 31 October 1966 from Headquarters, 84th Engineer Battalion (Construction) as indorsed.

2. Concur with the basic report as modified by the previous indorsements.

FOR THE COMMANDER:

W. R. Autrey, Cpt. AGC
W. R. AUTREY
Cpt, AGC

Asst Adjutant General

GPOP-OT (14 Nov 66)

4th Ind

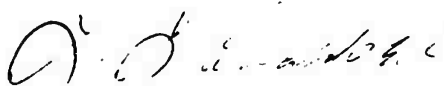
SUBJECT: Operational Report-Lessons Learned for the Period Ending
31 October 1966

HQ, US ARMY, PACIFIC, APO San Francisco 96558 14 JAN 1967

TO: Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D. C. 20310

This headquarters concurs in the basic report as indorsed.

FOR THE COMMANDER IN CHIEF:



L. L. CHAPPELL
MAJ, AGC
Asst AG